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Sano et al.

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(54) **APPARATUS AND METHOD FOR FORMING THERMAL TRANSFER PRINTING SHEET, THERMAL TRANSFER PRINTING SHEET AND THERMAL TRANSFER PRINTING METHOD**

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(58) **Field of Classification Search**

CPC G03G 16/00; G03G 8/00; B41M 3/12;
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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,208,251 B2 4/2007 Egusa et al.
2006/0046005 A1* 3/2006 McGee 428/34.4
2010/0105836 A1 4/2010 Mawatari et al.

FOREIGN PATENT DOCUMENTS

GB 2329480 A 3/1999
JP 58120060 U 8/1983

(Continued)

OTHER PUBLICATIONS

Sano et al. (JP 2007-283745 A), Nov. 2007, JPO Computer Translation.*

(Continued)

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(57) **ABSTRACT**

A method for forming a thermal transfer printing sheet, including (a) feeding a release sheet having a release surface; (b) transferring an image, which is to be thermally transferred and printed on a transfer medium, onto the release surface of the release sheet; (c) forming a thermoplastic resin pattern, which corresponds to the image as a transfer base material and which is to be colorless and transparent by heat and pressure, and transferring the thermoplastic resin pattern onto the release surface of the release sheet; and (d) fixing the image and the thermoplastic resin pattern onto the release surface of the release sheet in a film shape, through heat and pressure.

5 Claims, 8 Drawing Sheets

